

XXXVII Reunión Bienal de la Real Sociedad Española de Física



Real
Sociedad
Española de
Física

15-19 de julio de 2019
Zaragoza





Wave-couplers for see-through applications on photopolymers

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Nowadays, wearable eyeglasses and waveguides [1] are one of the most promising applications in photonics for the holographic recording materials. Holographic techniques structures together with the optimized recording materials permit the fabrication of the high resolution structures.

In the applications of see-through glasses, the light signal can be generated on the back of the human head and guided along the temples of the glass to the frontal lenses and redirected to the eye. Therefore, we need two wave-couplers, W-C, one to trap the light inside the temples, and second in the lenses one to redirect the guide light into the eye.

The holography gives us a possibility when we store the holographic optical element, HOE, with a determinate wavelength and we use the display with a longer one. Our proposal is fabricating this wave-couplers for normal light incidence using photopolymers, as recording material, because we can self-fabricate them and modify their composition and optical properties. We fabricate the HOE using a 532 nm laser to guide the 632 nm light. Furthermore, in this work we present the results obtained with different family of photopolymers [2].

This work was supported by the "Ministerio de Ciencia, Innovación y Universidades" (Spain) under projects FIS2017-82919-R (MINECO/AE/FEDER, UE) and FIS2015-66570-P (MINECO/FEDER). R.F. and M.M-V. acknowledge the financial support by the "Generalitat Valenciana" (Spain) under grants APOSTD/2018/084 and CDEIGENT/2018/024, respectively.

References

[1] J. Y. Hong, C.-K. Lee, S. Lee, B. Lee, D. Yoo, C. Jang, J. Kim, J. Jeong, and B. Lee, Scientific Reports 7, Article number: 2753 (2017).

[2] R. Fernández, S. Bleda, S. Gallego, C. Neipp, A. Márquez, Y. Tomita, I. Pascual, and A. Beléndez, Optics Express 27, 827-840 (2019).